



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,919	02/13/2006	Kwang-III Koh	WI7-004US	5727
959 7590 03/26/2008 LAHIVE & COCKFIELD, LLP ONE POST OFFICE SQUARE BOSTON, MA 02109-2127				
EXAMINER				
ALLI, PYABO				
ART UNIT		PAPER NUMBER		
2877				
MAIL DATE		DELIVERY MODE		
03/26/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/542,919

Applicant(s)

KOH ET AL.

Examiner

IYABO S. ALLI

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 07/20/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks on pages 7-17, filed on January 7, 2008, with respect to the rejection(s) of claim(s) 1-14 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of **Howells et al.** (US 6,183,186).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims **1-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Shigeyama et al.** (5,450,204) in view of **Howells et al.** (US 6,183,186) ('**Shigeyama**' and '**Howells**')

As to claim 1, **Shigeyama** discloses an image obtaining means **3** in which it is moved toward X,Y and Z shafts by the X,Y and Z shaft transfer means (Z shaft taught by **Howells** below), scans a grating image by the frequency of N times to a side of the measuring object **10** supported and fixed to the work stage **1** (Fig. 1), obtains the changed grating image by the measuring object by N times and alternately, scans the grating image by the frequency of N times to the other side of the measuring object **10**,

obtains the changed grating image by the measuring object **10** by N times (Column 3, lines 32-40); a light emitting means **2** mounted to a side of the image obtaining means **3** for generating and emitting light with a predetermined wavelength; and a control unit **4** which, by controlling the work stage **1** and the shaft transfer means, irradiates light generated from the light emitting means **2** mounted to a side of the image obtaining means **3** to the reference surface set the side of the work stage **1** (Column 3, lines 41-47 and Fig. 1); and thereafter receiving the reflected light image through the image obtaining means **3**, measuring a vertical distance, thereby maintaining a focus distance between the measuring object **10** and the image obtaining means constantly, and receives the changed grating image obtained from the image obtaining means, thereby producing the three-dimensional image (Column 5, lines 59-68).

Shigeyama fails to disclose an XYZ shaft transfer means mounted onto a base member; a work stage first and second guides and a guide transfer apparatus mounted to the base member, for moving a measuring object to a measuring position and thereafter supporting it and having a predetermined reference surface set at a side thereof.

However, **Howells** teaches an XYZ shaft transfer means mounted onto a base member (Fig. 9); a work stage **420** having first and second guides **510,512** and a guide transfer apparatus mounted to the base member **412** (Column 13, lines 63-67 and Fig. 11), for moving a measuring object **32** to a measuring position and thereafter supporting it and having a predetermined reference surface set at a side thereof (Column 13, lines 15-16 & 26-29 and Fig. 9).

It would have been obvious to one skilled in the art at the time of the invention to include the guides of **Howells** in the measuring apparatus of **Shigeyama** in order to provide a stable support for the support so that it can move easily in the desired directions so that different areas of the object under test can be measured.

As to claim 2, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 1 above **except for** wherein the XYZ shaft transfer apparatus is applied any one between a linear motor or a ball screw in order to transfer the image obtaining apparatus toward X, Y and Z shafts, respectively.

However, **Howells** teaches wherein the XYZ shaft transfer **554** apparatus is applied any one between a linear motor **560** or a ball screw in order to transfer the image obtaining apparatus toward X, Y and Z shafts **554** (Z shaft taught by **Howells**), respectively (Column 14, lines 19-24 and Figs. 9 and 10).

It would have been obvious to one skilled in the art at the time of the invention to include the shaft arrangement of **Howells** in the measuring apparatus of **Shigeyama** in order to transfer objects for measurements in obstructed paths where other components may be situated, minimizing bunching errors that may occur when components operate in close areas and knock into one other.

As to claim 3, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 1 above **except for** the first guide is installed to the base member to be fixed and has a predetermined reference to a side thereof; the second guide is installed in order to be transferred according to the size of the measuring object

on the basis of the first guide; and the guide transfer apparatus is installed that the first and second guides, respectively, are crossed at right angles and for transferring the second guide on the basis of the first guide.

However, **Howells** teaches the first guide **510** is installed to the base member **420** to be fixed and has a predetermined reference to a side thereof; the second guide **512** is installed in order to be transferred according to the size of the measuring object **32** on the basis of the first guide **510** (Column 13, lines 63-67 and Fig. 11); and the guide transfer apparatus **24** is installed that the first and second guides **510,512**, respectively, are crossed at right angles and for transferring the second guide **512** on the basis of the first guide **510** (Column 13, lines 60-67 and Fig. 9 and 11).

It would have been obvious to one skilled in the art at the time of the invention to include the guides of **Howells** in the measuring apparatus of **Shigeyama** in order to provide a stable support for the support so that it can move easily in the desired directions so that different areas of the object under test can be measured.

As to claim 4, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 1 above **except for** wherein said guide transfer apparatus is a ball screw.

However, **Howells** discloses wherein said guide transfer apparatus **24** is a ball screw **102** (Column 9, lines 8-13 and Fig. 9).

It would have been obvious to one skilled in the art at the time of the invention to include the ball screw of **Howells** in the measuring apparatus of **Shigeyama** in order to

easily move the components through the system, allowing multiple test cycles to be done in a shorter amount time.

As to claim 5, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 1 above in addition **Shigeyama** teaches a projection portion **25** which produces a grating image through a light source **2** emitting light and a grating, in which it is installed to a lower side of the light source **2** for receiving the light emitted from the light source **2** and moved by a grating transfer apparatus, and penetrates the produced grating image through a projection optical system **25** installed to a lower side of the grating **24** (Column 4, lines 18-27 and Figs. 1 & 3); a distributor, which is installed to a lower side of the projection portion **25**, distributes the grating image irradiated through a projection optical system **25** of the projection portion through first and second mirrors transferred by a mirror transfer apparatus and distributes the grating image through third and fourth mirrors which are installed to be horizontal to the left/right side of the first and second mirrors and first and second filters (Column 4, lines 24-30); and an imaging unit **34** which is installed to a lower side of the distributor, reflects horizontally the changed grating image in which it is penetrated through the first and second filters **23** of the distributor and irradiated to the measuring object **10** and then reflected, through an imaging mirror, and obtains the changed grating image through an imaging lens and an imaging device **34** to a camera **3** (Column 3, lines 29-47 and Figs. 2 & 3).

As to claim 6, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein the grating **24** is adapted as a liquid crystal grating (Column 4, lines 1-9 and Fig. 2).

As to claim 7, Shigeyama in view of **Howells** disclose all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein the grating transfer apparatus of the projection portion is adapted as a PZT (piezoelectric) actuator.

Although, **Shigeyama** in view of **Howells** *fails to disclose* the actuator being a PZT actuator, it would have been obvious to one skilled in the art at the time of the invention to utilize any suitable actuator in the measuring apparatus in order to accurately obtain a potential phase shifts and to exert counter forces on the systems forces for consistency purposes.

As to claim 8, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein a first mirror and a second mirror of the distributor are crossed, and formed at the center lines of each inclined mirror (Fig. 3).

As to claim 9, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein first and second mirrors of the distributor are adapted as a triangle mirror, respectively (Figs. 2 & 3).

As to claim 10, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein the mirror transfer apparatus is adapted as one among an air cylinder, a linear motor **1a/1b** and a ball screw (Column 3, lines 42-47 and Fig. 1).

As to claim 11, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 5 above **in addition Shigeyama** discloses wherein first and second mirrors of the distributor are adapted as a mirror rotation mirror (Column 4, lines 23-30).

As to claim 12, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 11 above **in addition Shigeyama** discloses the apparatus further comprising a rotation apparatus for rotating the rotation mirror **34** with a predetermined angle (Fig. 3).

And as to claim 13, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 12 above **in addition Shigeyama** discloses wherein said rotation apparatus is adapted as a mirror meter (Fig. 3).

As to claims 12 and 13 above, although, Shigeyama in view of **Howells fail to disclose** the rotating mirror being a galvano mirror, it would have been obvious to one skilled in the art at the time of the invention to substitute the galvano mirror with any mirror capable of being rotated with any mechanism which rotated devices in a measuring system in order to achieve the predictable result of extending the path length

of the light beam coming from the illumination source and varying the detected results for comparative techniques.

4. Claim **14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Shigeyama et al.** (5,450,204) in view of **Howells et al.** (US 6,183,186), as applied to claim 1 above, and further in view of **Nonaka et al.** (6,094,760). ('**Shigeyama**', '**Howells**' and '**Nonaka**')

As to claim 14, Shigeyama in view of **Howells** discloses all of the claimed limitations as applied to Claim 1 above **except for** wherein a laser pointer is used as the light emitting means.

However, **Nonaka** teaches wherein a laser pointer is used as the light emitting means (Column 4, lines 1-6).

It would have been obvious to one skilled in the art at the time of the invention to include the laser pointer of **Nonaka** in the measuring apparatus of **Shigeyama** in view of **Howells** in order to only focus on a specific area under test with a controlled illumination, so that areas on the device under test that do not need to be examined at that particular time, will not be inspected and negatively effect the resulting information being determined.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IYABO S. ALLI whose telephone number is (571)270-1331. The examiner can normally be reached on M-Thurs. 7:30a- 5pm, 1st F-OFF & 2nd F- 7:30a-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IYABO S. ALLI
Examiner
Art Unit 2877
March 19, 2008

/L. G. Lauchman/
Primary Examiner, Art Unit 2877